FLOATING DRY DOCK FOR LIGHT WATERCRAFTS

TECHNICAL FIELD

[0001] The present invention relates to a floating dry dock, and more particularly to a watercraft support platform casing which is rigidly connected to floatation casings, whereby to support a light watercraft above the water surface.

BACKGROUND ART

[0002] It is known to construct drive-on dry docks whereby a watercraft can enter an entry way of a floatation flexible dock and lodge itself into a channel or on smaller float casings of the dock. Such drive-on dry docks are for example described in U.S. patents No. 6,431,106, No. 6,526,902, No. 5,947,050, and No. 5,931,113. These dry docks comprise a plurality of floatation casings forming a dock surface on which a person can walk and an entry way in which a watercraft can enter when in motion. There are several problems associated with such flexible docks, one of them being that when the watercraft enters the entry way, it can damage the floatation casings which are disposed in the entry way and usually disposed lower than the surface of the floatation casings to the sides of the entry way. Because these floatation casings are formed of rigid plastic material, repetitive impact by the hull of a watercraft causes wear and tear, and the casings can become punctured and fill with water, causing the dock to sink in the forward entry way, thereby necessitating repair. The repair consists in removing the damaged casing from adjacent casings and because there are several connectors, one at each corner of the casings, this is a time consuming job and often the connectors fall into the water and become lost.

[0003] Another disadvantage of these drive-on dry docs is that an open entrance way is formed in the dock to receive a watercraft and because the casings are pivotally secured to one another, they flex with respect to one another, and make it hazardous to a person walking on the dock in the vicinity of the entrance way. Furthermore, these docks are constructed to support only a single watercraft and some of these watercrafts are only partly supported on the dock with the outboard engine in the rear end of the watercraft remaining in the water at the end of the dock.

Therefore, the watercraft is still partly submerged. In an attempt to resolve this type of a problem, the outer casing sections of these docks may be provided with large inflatable pontoons whereby to lift the watercraft completely out of the water. See for example U.S. patent No. 6,526,902 referred to hereinabove. Accordingly, it is necessary to pump air into the pontoons and to remove it therefore, whereby the outermost section is only buoyant enough to support itself, whereby it can be downwardly inclined when a watercraft enters the dry dock. This is a time consuming process for docking watercrafts, particularly when a watercraft is docked several times in a single day. Furthermore, the bow ridge of the watercraft impacts onto smaller floatation casings disposed along a center line of the dock, and is subjected to damage, as mentioned above.

SUMMARY OF INVENTION

[0004] There is therefore a need to provide a drive-on dry dock, which substantially overcomes the above-mentioned disadvantages of the prior art.

[0005] According to a feature of the present invention, there is provided a watercraft support platform casing for a floating dry dock and to which is rigidly secured floatation casings, and wherein a light-weight watercraft can enter the dry dock and propel itself on the support platform casing completely out of the water surface.

[0006] Another feature of the present invention is to provide a watercraft support platform casing for use with a floating dry dock, and wherein the floatation casings associated therewith are not impacted by the bow of a watercraft when entering the floating dry dock.

[0007] Another feature of the present invention is to provide a watercraft support platform casing for use in the construction of a floating dry dock, and to which is rigidly connected a plurality of floatation casings, and wherein the support platform casing has a lower forward projecting edge and a thraugh-like upper surface with a slope entry way, whereby to guide a watercraft in movement onto the ramp of the support platform casing.

[0008] Another feature of the present invention is to provide a watercraft support platform casing, which can be interconnected in series with a further support

platform casing, whereby to form a floating dry dock in combination with floatation casings to support a longer watercraft or two or more light-weight watercrafts in end-to-end relationship and above the water surface.

[0009] Another feature of the present invention is to provide a watercraft support platform casing rigidly connectable to floatation casings, whereby to form a drive-on floating dry dock for light-weight watercrafts such as in-board water jet propelled water crafts, making it easy for such water crafts to enter and exit the dry dock.

[00010] According to the above features, for a broad aspect, the present invention provides a watercraft support platform casing for a floating dry dock for light-weight watercrafts. The support platform is an elongated rectangular shaped casing dimensioned to support a watercraft elevated from the surrounding water surface. The support platform casing has integrally formed floatation chambers and opposed substantially parallel sidewalls. An elongated central ramp is formed in the top surface of the casing to support a hull of a watercraft position thereon. The ramp has a thraugh-like upper surface with a sloped forward entry way formed integral therewith and terminates in a lower forward projecting edge. The support platform has connectors secured to the opposed sidewalls for rigid interconnection with a plurality of floatation casings by fastening means to form a floating dry dock on a water surface with the entry way of the ramp position to receive the hull of a watercraft in movement whereby a watercraft can project itself on the central ramp above the water surface.

BRIEF DESCRIPTION OF DRAWINGS

[00011] A preferred embodiment of the present invention will now be described with reference to the accompanying drawings in which:

- figure 1 is a side view of a floating dry dock formed with the support platform casing of the present invention, and shown supporting a light-weight watercraft thereon;
- figure 2 is a side view similar to figure 1, showing a floating dry dock constructed in accordance with the present invention but shown supporting a larger watercraft thereon;

- figure 3A is a perspective view of the support platform casing constructed in accordance with the present invention;
- figure 3B is a bottom perspective view of the watercraft support platform casing of figure 3A;
- figure 4 is a perspective view showing a floating dock constructed in accordance with the present invention, and comprised of a plurality of floatation casings rigidly interconnected together and to the opposed sidewalls of the support platform casing;

- figure 5 is a section view through the support platform casing of the present invention showing the integrally formed hollow floatation chambers and the position of the hull of a watercraft supported on the ramp of the support platform casing;

- figure 6 is a partly fragmented side view of a connector which interconnects a floatation casing to the support platform casing and to adjacent floatation casings;
- figure 7A is a perspective view of the connector;
- figure 7B shows a modification of the connector wherein a threaded nut is removably securable to the lower connecting flange of the support platform casing;
- figure 8A is a perspective view of a winch mechanism secured to some of the forward floatation casings of a drive-on dry dock constructed in accordance with the present invention;
- figure 8B is a top view showing the winch mechanism having its winch line connected to the forward end of a watercraft being pulled forward onto the support platform casing of the dry dock;

- figure 9A is a top view similar to figure 8B, but showing the winch mechanism arrangement for discharging the watercraft from the support platform casing of the dry dock;

- figure 9B is a perspective view illustrating the winch mechanism associated attachment post for discharging the watercraft from the dry dock;

- figure 10A is a perspective view showing a dry dock constructed with two support platform casings interconnected end to end.; and

- figure 10B is a section view showing the two nested support platform casings when connected end to end.

DESCRIPTION OF PREFERRED EMBODIMENTS

[00012] Referring to the drawings, more particularly to figures 1 to 4, there is shown generally at 10 a floating dry dock constructed with the watercraft support platform casing 11 of the present invention, and rigidly interconnected with floatation casings 12. As shown in figure 1, the floating dry dock 10, constructed in accordance with the present invention, supports a light-weight watercraft 13 such as an inboard water jet propelled watercraft, above the water surface 14. Figure 2 shows a larger floating dry dock 10' constructed in accordance with the present invention, and supporting a larger watercraft 13' above the water surface 14.

[00013] Referring more specifically to figures 3A to 5, there is shown the construction of the support platform casing 11. As herein shown, the support platform casing 11 is molded from rigid plastic material, although it could be constructed of any other suitable material, and is in the shape of an elongated rectangular casing suitably dimensioned to support a watercraft 13 or 13' elevated from a surrounding water surface 14. It is pointed out that several sizes of these casings can be provided and adapted to support different types of watercrafts. The support platform casing 11, as shown in figure 5, is of hollow construction and has integrally formed floatation chambers 15 and 15', formed on opposed sides thereof. An additional chamber 16 may be provided in certain areas of a ramp 17. It is conceivable that the floatation chambers be injected with rigid foam material for strength and for preventing water infiltration.

[00014] As better illustrated in figure 4, the elongated central ramp 17 is formed in a top surface of the support platform casing 11, and is provided to support the hull 18 of the watercrafts 13 and 13'. The ramp 17 has a thraugh-like upper

surface 19 with a sloped entry way 20 formed integral therewith in a forward section thereof. The sloped forward entry way 20 terminates in a lower forward projecting edge 21. As shown in figures 1 and 2, this lower forward projecting edge 21 lies substantially at the water surface 14.

[00015] The sloped forward entry way 20 is comprised of a rearwardly and upwardly sloping forward section 24 of the ramp 17, whereby to lift out of the water and on to the support platform the watercrafts 13 and 13', entering the support platform at sufficient speed. This sloping forward section is a smooth section and merges into the upper horizontal support section 25, whereby to support the watercraft on the platform casing 11 over the water surface 14, as illustrated in figures 1 and 2. The thraugh-like upper surface of the ramp defines a central deep V-shaped depression 26 having outwardly sloping side walls 27 on opposed sides thereof, each terminating in an upper gently sloped hull support upper wall section 28, which constitutes the upper horizontal support section 25 of the support platform casing 11. Figure 5 better illustrates the cross sectional shape of the thraugh-like upper surface on which is resting opposed hull sections of a watercraft 13 positioned thereon.

[00016] As shown, in figure 3A, the lower forward projecting edge 21 is provided with a central forward guide cavity 29 to guide the bow center ridge 30 (see figure 2) of a watercraft entering into the support platform casing. This guide cavity is formed in a reinforced bottom wall section of the support platform casing 11, as shown in figure 3B. The bottom central section 30 of the V-shape depression 26 is formed with reinforcing cavities 31 to solidify the ramp in the forward sloped entry way 20 thereof, where is it subjected to impact by docking watercrafts.

[00017] As also shown in figure 3B, the bottom wall 32 of the support platform casing 11 has a reinforced coupling cavity 33 in a rear end wall 34 thereof, whereby to receive therein the lower forward projecting edge 21 of another support platform casing 11, when nested end to end, as will be described later.

[00018] Referring again to figures 3A and 3B, the watercraft support platform casing 11 is further provided with a plurality of connectors 22 equally spaced in the opposed side walls 23 and 23' of the casing in a common horizontal plane. These connectors 22 are in the form of projecting flanges or tabs 22', each provided with a connecting through bore 35, as better illustrated in figure 6, for receiving a threaded

shank 36 of a bolt fastener 37 therein. As shown in figure 6, this connecting through bore 35 is a threaded through bore. The connectors or tabs 22' are integrally formed with the side walls 23 and 23' of the support platform casing 11 and project from reinforced channel formations 37, which extend vertically in the opposed side walls 23 and 23', as illustrated in figure 3A. The projecting tabs provide inter-connection of the support platform casing 11 with standard floatation casings 40, as shown in figure 4. These floatation casings 40 are well known in the art and are usually of square block form, as herein illustrated, with connecting flanges 41 extending diagonally from opposed corners thereof in a common central horizontal region of the floatation casings. Two of these connector flanges, 41 and 41', on one side of the floatation casings, namely side 42, project lower than the other two connector flanges 41" on the other side 43 of the casings, whereby these connector flanges can overlap to interconnect the floatation casings with another. As shown in figure 6, the connecting tabs 22' of the watercraft support platform casing 11 are disposed lowermost whereby to receive an upper most connector flange 41 of a floatation casing 40 there over. As shown in figure 6, the connector flange 41" of a floatation casing 40 is disposed over the tab 22' of the floatation casing 11 with the through bore 44 of the connector flange in line with the through bore 35 of the tab 22'. The threaded shank of the bolt fastener 37 extends through these through bores and threaded into the connecting tab 22'. The connecting tabs 22' may also be provided with a smooth through bore and a threaded connector insert 45, as shown in figure 7B, may be slidingly secured over the opposed flat parallel surfaces 22" of the tab. As shown in figure 7B, the threaded connector insert 45 comprises a threaded nut 46 welded or integrally formed with a slide attachment 47 for slidingly securing the threaded nut under the flange tab 22' with a threaded bore 48 of the nut aligned with the connecting through bore 35, which now has a smooth inner surface so that the threaded shank of the fastener 37 threads into this nut 46 to provide the attachment.

[00019] The bolt fastener 37 is provided with a flared head 49 merging into a substantially smooth upper surface, which aligns with the top surface 49 of the floatation casings 40. These large connecting heads 49 mate with smooth angular depressions 50 formed in the top corners of the floatation casings 40. When these casings are secured side by side, they form a conical depression in their corner regions

to rigidly interconnect the floatation casings together through the bolt heads to prevent flexion of the connected casings with one another. Likewise, the reinforced channel formations 37 in the side walls 23 and 23' of the support platform casing 11 are provided with top semi-conical depressions 52 to also receive the conical heads 49 of the connectors 37 to provide rigid interconnection of floatation casings with the support platform casing to prevent flexion. Accordingly, when the support platform casing 11 is assembled with floatation casings to form a rigid floating dry dock, the floatation casings and the support platform casing do not flex with respect to one another. This provides for a rigid dry dock to support people and a watercraft thereon.

[00020] Referring now to figures 10 A and 10B, there is shown a larger floatation drive-on dry dock 10' constructed in accordance with the present invention, and wherein there are two watercraft support platform casings 11 secured end to end by the attachments of the surrounding floatation casings 40. As previously described, the support platform casings 11 are disposed end to end with the lower forward projecting edge 21 of casing 11' received in the coupling cavity 33 of the forward support platform casing 11. These casings are held in place by the interconnection of the surrounding floatation casings secured to the connectors 22 in the sidewalls 23 and 23' of each of the floatation casings and connected together. Accordingly, a longer watercraft can be supported on this flotation dry dock 10'. When the watercraft enters the dry dock, it is then pushed or pulled ahead onto the forward support platform casing 11'. To facilitate the positioning of the watercrafts on the floatation casing 11, there may be provided a winch mechanism as will now be described with reference to figures 8A to 9B.

[00021] As shown in figure 8A, the winch mechanism 60 comprises a connecting pedestal 61 having a securement base 62, which is secured to a pair of forwardly disposed floatation casings 40' positioned forwardly of the support platform casing 11', as shown in figure 10A. The winch mechanism has a line spool 63 provided with a winch line 64, which has a hook 65 at a free end thereof for securement of the front of the watercraft, as shown in figure 8B. A crank arm 66 operates the spool 63 to winch the watercraft 13 in proper position on the dry dock.

Of course, this winch mechanism 60 may be provided on a smaller dry dock, as illustrated in figure 4.

[00022] A pair of attachment posts 68 and 68' may also be secured to floatation casings 40" on opposed sides of the support platform casing 11, whereby to discharge the watercraft 16 from the floating dry dock by exerting a pushing force in the direction of arrow 69. This is done by passing the winch line 64 through an eyelet 69 secured to post 68', and then securing the hook 65 to a further eyelet 70 associated with the post 68. The winch line 64 is disposed over the bow end 70 of the watercraft 13 and by winding the winch line onto the spool 63, a discharge pressure from the line displaces the watercraft in the direction of arrow 69. As shown in figure 9A, the winch spool 63 may be pivotally secured to the top end of the connecting pedestal 61, whereby the spool can swivel to either side of the bow of the watercraft 63. On the other hand, the connecting pedestal 61' may be pivotally secured to the connecting frame 62, as illustrated in figure 9B.

[00023] It is within the ambit of the present invention to provide any obvious modifications of the preferred embodiment described herein, provided such modifications fall within the scope of the claims.